

NOTES

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ON THE CHOLERA AT VARNA IN 1854,

AND MORE ESPECIALLY IN

HER MAJESTY'S SHIP "AGAMEMNON,"

IN THE BLACK SEA.

BETWEEN THE 1ST AUGUST 1854 AND 8TH SEPTEMBER 1855.

BY

GEORGE MACKAY, M.D.,

ETC., ETC.,

STAFF SURGEON ROYAL NAVAL HOSPITAL PLYMOUTH, LATE SURGEON OF
HER MAJESTY'S SHIPS "BELLEROPHON" AND "AGAMEMNON."



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TO

SIR JOHN LIDDELL, M.D., F.R.S., C.B.,
ETC., ETC., ETC.,

DIRECTOR GENERAL OF THE MEDICAL DEPARTMENT OF THE NAVY,

THESE NOTES

ARE RESPECTFULLY DEDICATED

BY

THE AUTHOR.

PREFACE.

HAVING, in the course of my service in the Black Sea, been accidentally placed in a position to obtain some information of the Cholera which prevailed at Varna in the year 1854, I have embodied it in the following Notes, which originally formed a chief part of the "Remarks" appended to my Journal for H. M. S. "Agamemnon."

Somewhat amplified, they are now, "by permission," submitted to the notice of the Profession, with the hope that they may be found not altogether unworthy of a passing consideration.

Believing that the epidemic—which appeared amongst the Allied Troops at Varna in July 1854, and afterwards in the Fleets at Baljik, can be traced to its source in France, where it was known to exist in March of that year; and that its subsequent course can be fairly tracked in the company of the troops across the Black Sea to the Crimea, the Alma, Balaklava, and as far as the Straits of Kertch—I am anxious to bring the question of its origin more prominently before the Profession, with the view of directing attention to the inestimable advantages that would accrue to our Fleets and Armies were they to adopt

certain preventive measures whenever exposed to the contagious influence of the disease.

If the view here advocated be the correct one (and it is one entertained by not a few of our Medical Brethren), then the inference in the single instance of the outbreak in the Allied Fleets at Baljik is unavoidable, viz., that an immediate removal from the infected locality, or failing that, the adoption of a few simple, but stringently preventive measures, would, in all human probability, have saved the lives of hundreds of men.

GEORGE MACKAY.

R. N. H., PLYMOUTH, August 1857.

NOTES

ON THE

CHOLERA WHICH APPEARED AT VARNA IN 1854.

ON taking a retrospective view of the period embraced by these Notes, the mind is arrested by the many important events which occurred, and in which the "Agamemnon" took a prominent part. Shortly after the declaration of war, in April 1854, we find her engaged in scouring the coasts of Asia, Circassia, and the Crimea; visiting, and sounding wherever practicable, the various bays, creeks, and harbours; rejoining the combined fleets at Baljik for a few days; and again proceeding on a separate mission to Constantinople.

As the able and energetic officer whose flag she bore, was entrusted with the responsible and arduous duties of arranging and superintending the formation of a fleet of transports for the invasion of the Crimea, and as these duties required his presence in different places, his ship—a swift, as well as a powerful, man-of-war—was rarely allowed to remain many days at any one place, and his ship's company was constantly employed in all sorts of service. At one time engaged in landing at Varna, infantry, cavalry and artillery; clearing transports of all kinds of military stores, horses, mules, and cattle; and again preparing, and assisting the same transports, to receive the hosts destined for the Crimea.

And when the mighty armament started on its destined course, and the sea appeared covered, far as the eye could reach, with steamers and vessels in tow, the "Agamemnon" was in the midst of them, to guide and direct them; checking the irregular advance of some, spurring on the lagging energies of others; at one time, starting ahead, with the Allied Generals, to take a rapid survey of that part of the coast selected for the landing; anon, returning with full speed to her charge; sweeping round, and amongst them, in all directions; and finally bringing them, after several halts, within sight of the spot chosen to receive the hostile armies of three different nations.

Nor did the services of the "Agamemnon" end here. When the

landing of the troops, horses, artillery, etc., had been achieved (in which the seamen and marines of the combined fleets took their share), she led the advance of the in-shore squadron of observation, appointed to cover the right flank of the invading army; and in a depth of water barely sufficient to float her, she was present at the ever-memorable battle of the Alma; in which, however, only a few of the smaller steamers of the squadron were enabled to exchange shots with the enemy.

Soon as the sanguinary contest was over, she, in unison with her consorts of the fleet, poured out upon the strand her seamen and marines,—those true Samaritans of the sea, who, laden with cots and stretchers, conveyed from the field of battle to the beach the hundreds of wounded who had been struck down on that eventful day.

Here the energies and skill of the medical officers of the fleets were called into requisition; and medical men, of all grades, vied with each other in their efforts to assist and alleviate the sufferings of our gallant soldiers.

But still further services were required of the “Agamemnon;” and, in the midst of her exertions to provide accommodation for, and embark, the wounded and the cholera-stricken soldiers, she, at a hint from the Commander-in-Chief of the army, proceeded full speed along the rocky-bound coast of the Crimea, passing close in front of the alarmed harbour of Sebastopol, closely rounding the low point and sunken rocks of Cape Chersonesus, and forthwith making her appearance under the towering cliffs and perpendicular rocks of Balaklava. The enemy was still in possession of the place; but the appearance on the superincumbent heights of the dark uniforms of the Rifle Brigade, followed by bodies of light infantry, and a light field train; the firing of a few rounds of shot and shell from these, accompanied by the roar and reverberation among the rocks of a few guns from the “Agamemnon,” completed the capture of a harbour, afterwards celebrated for its many miseries. The next day witnessed, in the presence of Lord Raglan and his staff, and amidst the shouts of his admiring soldiery, the triumphant entry of the apparently huge bulk of the “Agamemnon” into this narrow harbour, this cleft of a rock; doubtless the first line-of-battle ship, and first screw steamer, that had ever been within its precincts. Hardly was she inside, when there followed various smaller men-of-war, and a stream of transports, laden with siege-guns, powder, shot and shell, provisions, clothing, camp equipage, tents, infantry, cavalry, artillery, etc.; and she was forthwith busily engaged in superintending, and assisting to land, all the materials necessary to a besieging army.

In the midst of this incessant labour, she was called upon to rejoin the combined fleets now about to attack the outer sea defences of Sebastopol; and on the 17th October 1854, memorable for the combined attack of the land and sea forces upon the doomed city, she, bearing, as before, the flag of the second in command, proceeded

to take up, and to maintain for four hours, in spite of a continuous storm of shot and shell, that position, which, in the opinion of the French Admiral and captains, was *the position* of the day. Such was the sentiment expressed by the senior officers of the French fleet, when they visited the "Agamemnon" the next day, to congratulate Sir Edmund Lyons on the gallant bearing of his ship and squadron.

Having refitted, and repaired the damages sustained in action, her duties now merged into the general duties of the fleet, of which she took her full share, and performed, during the long and dreary winter, her monotonous, but strict watch, over the harbour of Sebastopol. She was required, like other ships of the fleet, to land a small number of her seamen for the Naval Brigade; having already, previous to the 17th October, landed all her marines, to defend the heights commanding Balaklava; thus forming the nucleus for the Marine Brigade.

It may naturally be inferred from these arduous and incessant services, that the health and constitutions of both officers and men were severely tried; and, in addition to the lives lost, and the injuries sustained in action, not a few succumbed to these arduous duties, combined with the hardships and privations caused by the severity of the weather, and the want of a regular supply of fresh provisions, and more especially of vegetables. A strong scorbutic tendency was developed in the system, which rendered it less able to cope with the low fever, which prevailed during the winter.

But the great scourge of both our armies and our fleets was the *Asiatic Cholera*, which may be truly said to have joined the invading army on its first formation, and to have clung to it, amidst all its successes and reverses. And this dire scourge, which committed such ravages amongst the allied troops in Bulgaria, and the allied fleets anchored off the same coast, was, in my opinion, undoubtedly imported from Marseilles and Galipoli by the numerous levies of French troops, which were frequently arriving, to swell the strength of the army preparing for the invasion of the Crimea.

As surgeon of Her Majesty's ship "Bellerophon," 78 guns (stationed at Varna, coast of Bulgaria, during the months of May, June, part of July, and the whole of August 1854, to superintend, under the command of Lord George Paulet, the disembarkation of our troops, artillery, etc.), I had frequent opportunities of visiting the different encampments, military hospitals, and Quarantine Establishment on shore, as well as of making inquiries on board the French and Turkish men-of-war anchored in the bay. I found that the prevailing opinion amongst the medical men, both on shore and afloat, was, that this disease, which first appeared amongst the French troops, was imported by them direct from Galipoli or Marseilles, at which places it was known to prevail at the period of their leaving.

A sporadic case occurred in the French camp on the 17th June

1854, and another case on the 3d July ; but as 300 French troops had arrived on the 26th May 1854, in the French steamer "Cacique," from Galipoli, and other troops followed them almost daily, it is not unreasonable to infer, that the disease, which, since 1848, was unknown at Varna and its neighbourhood until after their arrival, accompanied them in their transit. And this inference is strengthened by the fact, that the French war-steamer, the "Dauphin," sent a case of cholera to the French military hospital at Varna on the 10th July, the same day that she arrived from Galipoli. Up to that date, no case of cholera had appeared, or been received into that hospital ; but after that, viz., on the 11th July, two of the patients in the hospital were attacked, and died ; next day three or four more ; two fresh cases came in on the 14th July, and died ; after which the number of cases increased daily. Several of these were from the French transports in the bay, but the greater number from the troops encamped on the plain at the foot of the hills.

The first decided case amongst the British troops in Bulgaria, occurred in the British military hospital at Varna on the 21st July, according to Mr Deas, then Deputy-Inspector of Hospitals and Fleets ; but, according to my notes, taken during a conversation on the 28th July with Dr Hall, the Army Inspector-General, the first case occurred in the hospital on the 22d July, on the evening of which day the disease broke out with great virulence amongst our troops at Devnah.

The British military hospital formed part of the same building with that occupied as an hospital by the French. Exteriorly, this appeared as one continuous building ; but interiorly, it was divided into two distinct squares, separated by a paved carriage-way. Over the two extremities of this carriage-way rose two large guard-houses, three stories high, with a great archway passing through each. These being placed at opposite sides, appeared as the chief ornament of the whole building, joined the two squares into one, and formed the main entrance to each. Archways of less pretension led through the squares at right angles to the carriage-way. This carriage-way, having one extremity closed up, formed the entrance to the French hospital ; to which, after walking half-way up the carriage-way, you were admitted by turning to the left. The gateway opposite this on the right, which would lead into the British hospital, was also closed up, and the entrance to that establishment effected from the outside by the opposite gateway. By this arrangement, what was originally a large barrack, and, at the time of our first visit, occupied by Turkish and Egyptian troops, was, by the liberality of the Turkish Government, converted into two distinct hospitals ; to which the sick of either army were admitted, without interfering with each other.

The French hospital was under the direction of Dr Levy, who held a position equivalent to the rank of general in the French army, and who had under him M. Saleron, as Chief Medical Officer

in charge of the hospital, and a large staff of medical officers. The British hospital was under the direction of Dr John Hall, Inspector-General of Army Hospitals, assisted by Dr Dumbreck, Deputy Inspector-General, and Dr Jamieson, staff surgeon, with several subordinate medical officers.

A portion of each hospital was given up for the reception of commissariat stores, but there were from 10 to 12 wards available in each; and each ward was capable of accommodating 34 patients.

The first man attacked among the Turkish troops was a *sentry*, who was stationed close to the French camp, and who was attacked whilst at his post on the 22d July, and immediately conveyed to the Turkish military hospital.

On the following day, the 23d, one of the patients in the same ward with this man was attacked; and on the following day, the 24th, three fresh cases were admitted from the camp; after which the disease spread both amongst the troops in camp, and the patients in the hospital; eight of the hospital attendants also being attacked. At this time there were about 6000 Turkish troops in Varna and its neighbourhood.

Here I may be permitted to make a slight digression, in order to bear my humble testimony to the orderly, clean, and well-conducted hospital belonging to the Turkish forces stationed at Varna. I visited it several times, and on each occasion was received with courtesy, my inquiries answered with frankness, and the whole interior thrown open to my inspection.

It is a quadrangular pile of stone, standing upon the same ground as, but about five hundred yards to the westward of, the large barrack above described. It enclosed an open piece of ground, intended as a place of recreation for the patients, having in the centre a fountain, round which is a small projecting frame-work supporting vines and other creeping plants, and affording a pleasant protection from the sun. A large archway on the east side of the building leads into the square. On each side of this archway is a high open passage, paved with round uneven stones; that on the right leading to the kitchens, bathhouses, deadhouse, and rooms for storing firewood; that on the left leading to small rooms, occupied by the medical officers, their attendants, the dispensary, etc. One large apartment was filled with an assortment of recently arrived new bedding and clothing, all of which was of good quality, and well-made in the Turkish fashion; the beds being of quilted cotton, covered with chintz. The dispensary was well supplied with medicines, and the most modern medical and surgical appliances. There were ten wards, each capable of holding comfortably thirty-eight patients; in addition to which, there were two large wards not fitted. The wards appeared roomy and lofty, and well whitewashed. Each had seven small square windows on one side, and four on the other, and a water-closet fitted in the Turkish style. The bedsteads, arranged along the walls, and in two rows in the centre, consisted of

old-fashioned wooden frames or boxes six feet long by three feet wide, and raised about eighteen inches from the floor by stout legs. The bottom of each was planked; but the whole of the bedsteads and the flooring looked clean and well-scrubbed. There were no curtains, nor framework for curtains. At the time of my first visit, in the beginning of June 1854, the establishment was in the temporary charge of an English surgeon, who held the appointment of surgeon to one of the Turkish regiments in the garrison. The prevailing complaint *then* was scurvy, of which there were several bad cases. There were also a few of the Turks who had been wounded in engagements with the Russians in the Dobrudscha. The patients looked comfortable and cheerful, and appeared to have great confidence in their medical officer, who spoke to them in their own language.

During my subsequent visits in July, the hospital was in charge of a Turkish medical director, named "Sali Effendi," who ranked with a colonel in the army, and who had been serving with the Turkish army at Schumla and Silistria. He was assisted by M. Jeannides, an Italian, who held the degree of Doctor of Medicine and Surgery from the University of Constantinople. Under these were two Greek surgeons, possessing the same degree from Constantinople, and two or three apothecaries, without any qualification. Their mode of practice seemed to be based upon the French system.

These officers informed me, that when the cholera broke out among the French, they immediately took steps to clear out the hospital. They removed nearly two hundred of their slightest cases to an encampment (this measure had also been adopted by the French and English at their hospitals); about a similar number of their more troublesome cases they embarked for Constantinople, leaving about the same number under treatment at the hospital. Both the senior men had witnessed cholera in Constantinople in 1848, one observing that 400 deaths from cholera had occurred in a cavalry barrack at Beicos, in the Bosphorus, in twenty-four hours. These officers attributed the *diarrhœa* prevailing amongst their troops to the *water* which they drank having become deteriorated by soap, and other matters, as it passed through the *French camp*, before it reached the Turkish camp and town. The English, as well as the French soldiers, had recourse to the same sources, or rather fountains, for water, as the Turks; but a large portion of the French troops was encamped on the hills about two or three miles off, and consequently much nearer the springs; and, as I know from observation, that the French soldiers availed themselves on all occasions, when possible, of every spring and stream of water to wash themselves and their clothes, there can be no doubt that the *water* used by the troops encamped on the plain and near the town was much contaminated. At the same time, it is to be observed, that cases of *diarrhœa* and fever generally occurred at this time of the year, and were considered due to the emanations from the large fresh water or brackish water lake close to Varna.

Varna is a strongly-fortified town, containing about 15,000 inhabitants, and of considerable importance, as the principal seaport of Bulgaria. Here are extensive barracks for the accommodation of troops (already described as the French and English hospitals). It is built at the bottom of an open bay, on part of an extensive plain, which, stretching from the bottom and north side of the bay, reaches, by a gentle ascent of two or three miles, to a chain of steep hills. These hills encircle the north side of the plain like a vast amphitheatre. They appear to be a continuation of a spur of the Balkan Mountains, and terminate on the sea-coast in bluff cliffs. On a plateau surmounting these hills, was encamped a large portion of the French army. The south-west sides of the town and plain were bordered by the lake (Lake Devno) above mentioned, which was fed by a river and streams from the interior. This lake approached the beach by marshes, and communicated with the sea by a stream sufficiently strong to turn a mill. A good public road led across the stream by a stone bridge of one arch, passed along the beach between the marshes and the sea, and divided into paths, leading up to villages on the opposite side of the bay. From the south side of the lake and marshes, the ground rose, by a rapid ascent, to an elevated and well-wooded range of hills which ran out towards the sea in a bold promontory (Galata Bournou), and faced the south side of the bay with steep wooded acclivities, or almost perpendicular rocks.

A portion of the British cavalry was for some time encamped on these hills, to the south of the bay, where also a portion of infantry was sent to cut wood for "fascines" and "gabions." Solitary tents, and small encampments of engineers and artillery, etc., occupied spots at the bottom and south side of the bay, near to some fountains, and close to where a "landing-place" had been constructed by our engineers and sailors.

The great bulk of the British army was encamped on the plain to the rear or westward of the town; the encampment extending backwards parallel with, and close to, the northern border of the lake. The Turkish troops were encamped nearer to, and chiefly within, the fortified lines of the town, and also on that part of the plain bordering the sea to the north-east. Some portion of the French troops occupied the plain to the north and north-east of the British, and nearer the base of the hills. The plain, and more especially that part of it on which the British troops were encamped, was stated to have been the burial-ground of the Russian troops who besieged Varna in 1829, and who were almost decimated by disease.

Considering the crowded state of Varna, where so many Jews, Greeks, and Armenians, as well as French, and a few English traders, flocked in with the allied troops—considering its narrow, partially paved, dusty or muddy streets, its rows of wooden booths and shops, its badly constructed and rickety wooden houses (there were a few stone buildings, and a large warehouse of modern construction near

the custom-house), and the questionable habits of its residents, it is surprising that cholera did not make its appearance sooner amongst the townspeople, and that its ravages were not greater than, if so much as, amongst the troops.

Upon the authority of Mustapha Effendi, the Quarantine Inspector of all the districts in and around Varna, and who had resided in Varna since the year 1844, the first case of cholera amongst the inhabitants occurred on the 21st or 22d July; but it was not until after the 26th July that the disease assumed an epidemic form, only four deaths occurring from it between the 21st and 26th July, but 177 deaths between the 26th July and 7th August. I am unable to state how the disease progressed amongst the inhabitants after the 7th August. Mustapha Effendi assured me that all deaths amongst the inhabitants were reported to him, and he issued all the orders for burial; and he was therefore certain of the correctness of the figures which he gave me. His words were, that "no *body* could be buried without a certificate from the surgeon of the Quarantine Establishment, and an order from himself, the director." I have from him the number of deaths that occurred *daily* between the 26th July and 7th August, but it is unnecessary to detail them here. During the two last days, the 6th and 7th, the number of deaths had diminished one-half.

There were many unlicensed practitioners amongst the inhabitants, but only two educated and licensed, Dr Petrini and Dr Angelini, Italians, the latter of whom was the Medical Superintendent of the Quarantine Establishment. This gentleman informed me that he had only recently taken up his appointment, having come direct from Silistria, where he had been serving with the Turkish troops. There had been no cases of cholera amongst them, nor in Silistria, when he left. He had not, as yet, met with any cases in Varna of what he considered true cholera, but he had heard of cases having occurred since the 21st July.

According to Mustapha Effendi, "intermittent" and "remittent" fevers prevail at Varna during the months of July and August; but he had observed that these periodical fevers had increased within the preceding four years, and he attributed their increase to the water of Lake Devno not having so free an exit as formerly. The last outbreak of cholera at Varna occurred in 1848, at which time it prevailed in Constantinople also. It was not of a severe character, if we may rely upon his figures, as he informed me that, out of 700 cases, only 180 died.

According to the same authority, and also the authority of the Turkish Admiral, who commanded the Turkish ships at Varna, and who paid an official visit of ceremony to Lord George Paulet of the Bellerophon, on the 29th July, no case of cholera had occurred among the Turkish traders, transports, or men-of-war, anchored in the bay up to that date, viz., the 29th July; but on board one of the Turkish two-deckers (I visited both the Turkish two-deckers that

day), a case of what the surgeon called "cholerine" occurred on the 25th July, and was still under treatment. This patient I saw on my visit to the Turkish ship on the 29th, and it appeared to me to have been a mild sporadic case of cholera. The average number of sick on board the Turkish ships was not greater than our own. There were cases of diarrhoea, but the prevailing disease was scurvy, of which there were about twenty cases in the list, out of a ship's company of 800 men. I was also told that from fifty to sixty of the crew had symptoms of scurvy. This disease had prevailed to a great extent among the sailors of their fleet during the preceding year, and many men had died from it. The diet of their men consisted of rice and bread; they were not allowed salt meat; and when in harbour, they were only allowed fresh meat on two days of each week.

The medical men I met on board these ships had been educated at their own University in Constantinople, passing out with a degree of Doctor of Medicine and Surgery after from four to six years' study. I was informed that about 100 graduates had passed out of the University since its establishment in 1842; and of these, eleven were in the navy as surgeons-in-chief, equivalent to our naval surgeon, but ranking with a "bimbashi," or major in their army. Each had, as assistants under him, a so called "surgeon," and an "apothecary," neither of whom had passed any examination, but who were selected by the chief medical officer at Constantinople for their "intelligence" and "experience."

On the 31st July, cholera broke out on board the Turkish two-decker, "Peiki Messiret," 84 guns, with 725 men, and between that date and the 5th August carried off six out of thirty men attacked. Fatal cases of cholera had appeared, as already stated, some time previous to this on board the French transports, and these cases were sent to the military hospital. The captain of a French transport was removed to the hospital on the 28th July, and died in five hours. The "Valmy" line-of-battle ship, bearing the flag of the French Commander-in-Chief at Varna, was attacked with cholera on the 28th July, and compelled to put to sea on the 31st. The "Bayard," French two-decker, with 860 men, had not had a case up to the date of my visit, the 29th July; but the surgeon told me that there had been about twenty cases of "cholerine," in five or six of which there were cramps. He had also had a case of cholerine that morning, and there were cases of diarrhoea; but the number of sick altogether on the list was only 39. This medical officer told me that he had seen a great many cases of cholera in 1833 and 1835.

The first case among the English vessels at Varna appears to have occurred on board No. 56 transport, named the "War Cloud," about the time the French troops (Zouaves) were embarking on that expedition to Kustendjé, which cholera rendered so disastrously fatal. The expedition departed on the 24th July; the fatal case of the "War Cloud" occurred on the 23d July. The crew of this transport subsequently became very sickly, and another fatal case occurred on the

30th July. She put to sea on the 1st August, and went to Baljik, where she anchored near the fleet for the benefit of medical assistance.

On the 24th July, the number of patients (including all complaints) in the British military hospital was 488; but 110 of that number were embarked that evening on board a transport (No. 60) in order to leave more available space for the increasing cases of cholera. On the 26th July, five cases of cholera, of which two proved fatal, occurred amongst the 110 invalids embarked on board that transport.

I am unable to state whether other cases of cholera occurred among the English transports at this time. I think I would have heard of them had they occurred, as Lord George Paulet was senior and commanding officer in the port; but I believe the cases in the "War Cloud" to have been the first.

With respect to our men-of-war at Varna, the first two cases occurred almost simultaneously and suddenly: one on board the "Bellerophon," at 10 P.M. of the 31st July, which case recovered; and the other six hours afterwards, viz., at 4 A.M. of the 1st August, on board the "Sanspareil," 70, anchored much farther out from the crowd of vessels—this case proved fatal. The weather at this time was warm and sultry, with light winds from the north-west; thermometer 75°. On the 29th July, the forenoon had been sultry and calm; but in the afternoon there was a heavy thunder storm, with much vivid and forked lightning, succeeded by a heavy fall of rain, which continued throughout the night. The next day, the 30th, the weather was cloudy, squally, and cold, with the wind from the north. The first day of August was fine and mild, with a light easterly breeze; and the easterly wind and fine weather lasted several days afterwards.

The "Simoon," man-of-war, arrived from Constantinople, and anchored on the 3d August. Her first fatal case of cholera occurred on the evening of the 7th August, and her second case on the 19th, when her captain was attacked and fell a victim.

At this time, the number of vessels in the bay was considerable. A great majority of the French transports consisted of small brigs, brigantines, schooners, and barques, which, from their light draught of water, were enabled to anchor close to each other, and to the beach. Not a few of the Turkish transports, trading vessels, and coasters, were also moored close to the shore.

The English transports, being large steamers, or large sailing ships, could not anchor so near; but, for the greater facility of landing their troops and stores, they approached the shore as closely as possible, and were not, on an average, at a greater distance than from ten to fifteen minutes' pull from the landing-place.

The men-of-war were moored farther out (excepting the "Bellerophon," moored in 7½ fathoms); but all were sufficiently near to allow their boats and crews to be constantly employed in passing to and fro between the transports and the shore, doing all the work

of disembarking and re-embarking the troops and materials of an invading army. In these duties, the *crews* of *all* the men-of-war in the bay, French, Turks, and English, took a part.

As to the crews of the "Bellerophon" and "Sanspareil," they spent more of their time in their boats, and on board transports, and on shore at the wharfs, than on board their own ships; and yet it is worthy of remark that the "Bellerophon's" man, who was so suddenly attacked with cholera on the night of the 31st July, had not, according to his own statement, been out of the ship for three weeks, his duty as a cooper keeping him on board all that time. Although a steady well-behaved man, and far from being unwell, he was of a small and weak frame of body, and delicate appearance. Diarrhœa was a very prevalent complaint amongst the men during the whole of July and the latter part of June; but although diarrhœa continued to prevail, no other case of cholera occurred on board the "Bellerophon" until the 13th August. She did not, however, go to sea until the 7th September, when she sailed with the expedition to the Crimea.

In consequence of the number of vessels that passed in and out, I found it too difficult a task to count the number at anchor in the bay on any one day. I therefore quote from the "Times correspondent" what I believe to be a correct approximation to the truth. He says, "that on the 9th August there were 360 sail of vessels at Varna;" and again, "On the 14th August, there are now nearly 600 vessels in and about Varna Bay."

Among such a number of seafaring men, crowded together within the precincts of one bay, it is only matter of surprise that, where communication was unrestricted, so few fell victims to the cholera; the disease only appearing here and there, without spreading epidemically.

It is unnecessary for me to attempt any account of the outbreak of the disease in that portion of the English fleet stationed at Baljik, as that has already been well described in Sir William Burnett's official report, printed by order of the Admiralty. But I will take the liberty of quoting from that report the statements, that "the first case in this division of the fleet was a solitary one, which occurred in the 'Diamond' on the 16th July, at least ten days before the choleraic tendency was observed in any of our ships of war, whether at sea or in harbour;" and, "on the 14th July, a French steamer, the 'Primoguet,' arrived from Toulon; and, as several of her crew were affected with cholera, she was sent in-shore of the English squadron to be cleared out, and to undergo a sort of quarantine. The weather at that time was tempestuous, and the wind blew towards the 'Diamond' from the position of this steamer and her tents."

Further on, I will endeavour to trace the *source* of this outbreak at Baljik; but I will now proceed with the "cases" in the "Agamemnon."

THE CASES IN THE "AGAMEMNON."

The "Agamemnon" started from Baljik on the 21st July to reconnoitre Sebastopol and the Crimean coast. On the 27th July she returned to Baljik, and on the following day anchored at Varna, where she remained until the 1st August. No restrictions of intercourse were placed upon her officers or men, and she communicated freely both with the shipping and the shore at Baljik and at Varna.

As in all the other ships (speaking generally), so also amongst her men, diarrhœa was a prevailing complaint. She left Varna, and steamed for the Bosphorus on the 1st August, anchoring the same day off Bujukdere. Here she remained until the 9th August; her first fatal case occurring on the 4th, in the person of the midshipmen's steward, who, from his position, and the duties required of him, had more communication with the shore, at all the places she touched at, than others of the ship's company. He was a pensioner from the marines, aged 45.

The second case occurred on the 8th, and proved fatal on the 9th August; the patient being a marine, aged 33.

Not having joined the ship at this time, I am unable to give any further particulars of these two cases.

The "Agamemnon" having left the Bosphorus on the evening of the 9th August, anchored on the following day amongst the fleet at Baljik; but, as several of the ships were under weigh that day to proceed to sea in consequence of the outbreak of cholera amongst them, she also weighed next day, the 11th, and came to Varna. On the 12th August I joined her from the "Bellerophon," still at Varna; and here these two ships remained, with others of the fleet, to complete and assist in carrying out the arrangements for the embarkation of the army destined for the Crimea. It was in the performance of duties connected with these arrangements that so many of our men were attacked by, and fell victims to, the cholera.

The crews of each man-of-war were divided into so many "boat parties," and had a certain number of transports assigned to them, which they had to fill up with the troops, provisions, water, etc., allotted to each. This work was carried on incessantly during the daylight, and often until late at night, one boat's crew relieving another to obtain their meals.

Certain parties of men were told off for the "duty" of remaining on board the transports, to receive and hoist in whatever was brought alongside by the "boat parties;" their meals were carried to them, and they remained on board all day, or until the duty assigned to them was completed. It was chiefly from *this "kind of party"* that we received the cases of cholera which terminated so fatally to the "Agamemnon's" men.

Before proceeding to adduce cases in support of this fact, I must state, that the *third case* of cholera in this ship occurred on the 23d August, in the person of one of the ship's boys named Hoskins,

aged 17, and who was on the sick-list, and recovering from an attack of diarrhœa, for which he had been admitted eleven days previously. At the time of his admission, the 12th of August, there were sixty-three patients on the list (ship's company 850), a majority of whom were labouring under diarrhœa. Now the diarrhœa, although very prevalent, was quite amenable to treatment; and those attacked at the same time as himself, returned to their duty after six or seven days' treatment. The daily number of admissions, too, had diminished *one-third* by the time he was seized with cholera. We had no bad case of diarrhœa, nor any suspicious case; and therefore, in the absence of any distinct trace of the immediate exciting cause, I am led to conjecture that he imbibed the "cholera poison" from some of the men who had been at work on board the transports.

It is the custom on board ship to allow the men who have been away in "working parties" an extra half-hour to smoke, should they not be on board at the usual smoking hour; and, as they have stories to tell of the "day's work," listeners gather round them to hear of their "feats" with horses, mules, and bullocks. They have also listeners in their own messes on the lower deck; and, as medical men "have witnessed several instances where the malady seemed to have been communicated through the medium of clothes, bed-coverings, etc.," and that "even those who escape the disease themselves, may convey it in their clothes to others" (see *Brit. and For. Med. Chirur. Review* for January 1856), there is nothing improbable in the surmise of this young lad (who was more susceptible from his debility and tendency to diarrhœa) receiving the "seeds" of his fatal disease in this way.

Three days after the occurrence of this case, the "fourth" was admitted. He was a marine named Thomas King, aged 34, seized at 3 A.M. of the 26th August, having been at work on board No. 19 transport on the previous day. This man admitted his having drank some "aguardiente," or bad brandy, on board that vessel. He died nine hours after his admission on the list. Another marine of the same party escaped cholera, but nearly died from excessive indulgence in the "aguardiente." The "fifth" case of cholera occurred on the evening of the 28th August, and terminated fatally in fifteen hours. This man, J. Mustin, aged 25, was a marine of the same working party as the preceding. The "sixth" case, also a marine, T. Mumford, aged 41, was admitted forenoon of the 29th August, and died at noon of the 2d September, of consecutive fever. It is not stated in my notes that this man was one of the same party as the two last, but I believe that he was in one of the "working parties;" and in my "sick-book" I find the following entry, dated 28th August 1854:—"Cases of 'diarrhœa' becoming more frequent, especially among the marines employed on board the transports embarking military stores, etc."¹

¹ Since writing the above, I have come across the copy of an official letter to the Director-General, dated 29th August 1854, in which, after an-

The marines were chiefly employed on this duty, and suffered more in proportion than the seamen, who were more especially employed in the boats, towing the "flats" and paddle-box boats, which conveyed the stores, as well as the troops, cattle, etc., to the transports.

When our seamen were employed on board the transports, they also suffered, although not to the same extent.

A move now took place in Varna Bay, and all the shipping were under sailing orders. At four o'clock in the morning of the 5th September, the "Agamemnon" weighed, and steamed out of the bay, and six hours afterwards was quietly at anchor among the ships at Baljik; where a delay arose in consequence of the non-arrival of certain transports, and the deficiency in others of a plentiful supply of water for the horses embarked. Ships were consequently obliged to hoist out boats, and send them on shore "to complete water." At this time distilled water alone was ordered to be used on board the "Agamemnon."

At five on the morning of the 7th, the weather being beautifully fine, and a cool S.W. breeze blowing, the "Agamemnon" was under steam with the "Bellerophon" in tow, and the whole fleet of transports and men-of-war were under weigh, and moving towards the north-east.

A party of forty-four marines had been engaged during the 3d and 4th September on board a transport named the "Albatross," embarking bullocks, horses, and stores. One of these men, J. Lever, aged 26, was suddenly attacked with diarrhoea at four o'clock A.M. of the 5th September, as the ship was getting under weigh. He went into the "head," and remained there until six A.M., when he proceeded to the sick-bay, where he fell down in a faint. He was immediately attended to, as cases of diarrhoea were then rather numerous as well among the marines as among the seamen, who had been roused out of bed at two o'clock on the morning of the 2d September to extinguish a fire on board one of the transports. He was, however, far advanced in the collapsed stage; and, notwithstanding all our efforts, he died at eight P.M. the same day.

Another marine of the same party, J. M'Anmally, aged 27, was seized with cholera on the forenoon of the 5th, and died at noon next day. This man acknowledged having had diarrhoea for two days without mentioning it, or asking for medicine.

One more, still a marine of the same party, came in with confirmed cholera on the morning of the 7th September (G. Perry, aged 26), and died at three P.M., after nine hours' illness.

A young seaman, who had been on board the same transport at work for a short time, had a mild attack of cholera on the 8th September (G. Woollacott, aged 19, ordinary seaman). This was the tenth case of cholera on board the "Agamemnon," and may

nouncing the deaths of King and Mustin, I add, "there is another marine of the *same party* (T. Mumford, æt. 41) now dangerously ill from cholera; and several of the men are now coming in with very suspicious choleraic symptoms."

be said to be the last of the cases originating in "embarkation duties."

The men of this party were mustered for my inspection on the morning of the 7th, and appeared to be in good health, having no complaint. An ounce of quinine wine was administered to each, and again in the evening, and the following day.

I do not know whether cholera had appeared amongst the crews of the transports in which our men had been at work whilst at Varna, but I do not doubt that the exciting cause existed on board in some shape or other. For instance, our men embarked on board the "Albatross" 300 bullocks and eight horses, with 150 Turks, as servants, attendants, etc., all being in charge of eight commissariat officers. These, be it remembered, came from encampments where cholera had recently committed great ravages.

The next five cases, however, are more clearly traceable to an infected ship, and occurred after our arrival on the Crimean coast, and when our men were again engaged in clearing transports. I was informed by the officer in charge of our men (now Commander T. L. Gaussen, R.N., and who himself suffered from repeated attacks of diarrhoea whilst employed on this duty), that cholera prevailed on board the "Lord Raglan" transport, during the passage from Varna to the Crimea: two men of the Rifle Brigade, one artilleryman, and one of the seamen, having fallen victims during the transit of from seven to ten days across the Black Sea.

At the time our men went on board, to clear her of the party of Rifles, the artillery, and horses she brought over, they and their officer saw one man labouring under the disease, and the body of another who had just died of it. Curiosity prompted some of our men (Weatherly, I believe, was one) to go down below, and look at the cholera cases. The result was, that J. Weatherly, aged 30, A.B., a most active man of the gunner's crew, who was of material assistance in managing the horses, was seized with cholera whilst in the act of slinging one of the horses. He was immediately removed to the "Agamemnon" (two P.M., 17th September), and died that night at eleven o'clock, nine hours after he was brought on board.

Next morning, the 18th, four more men of the same party, marines, all stout muscular men, were admitted with cholera. Three of them died that day; one, aged 22, in eight hours; one, aged 31, in twelve hours and a half; and the third, aged 28, died in fifteen hours. The fourth, aged 22, lingered on till half-past five P.M. of the 19th, when he also succumbed.

At this time, our ship was moving along the shore in six fathoms water, keeping pace with our advancing army, and watching the Russian army encamped behind the Alma, whilst their cavalry advanced to skirmish.

The excitement consequent on the scenes now enacting before their eyes, may have rendered our men more impervious to the

lurking poison of cholera. They certainly had but few complaints; and our sick-list amounted to thirty-one, in a ship's company of 850.

Diarrhœa was still a prevailing complaint, but the numbers did not increase until after our arrival at Balaklava, where we entered and moored on the 27th September.

Here, in consequence of the excitement attending the capture of the place, the incessant work our ship's company had to undergo in landing, as quickly as possible, troops, artillery, siege-guns, powder and shot, etc., and their mingling unreservedly with the soldiers, of whom there were crowds in Balaklava, besides 420 sick, chiefly cases of cholera,—diarrhœa became again prevalent, and as many as seventy cases were prescribed for in the morning at this time. Two of these (marines) were attacked with symptoms of cholera during the night of the 27th; one died on the 30th; the other recovered: and another man, a seaman and coxswain of the "Launch," who had been constantly employed, since our entrance into Balaklava, in conveying in his boat soldiers and military stores, was admitted at five A.M. of the 3d October, and died in five and a half hours.

It may be remarked of this man, J. Perrington, aged 48, coxswain of "Launch," that, as the petty officer in charge of the boat, he had a greater license to visit the transports, and the houses on the beach, during his various passages to and fro; and, moreover, his boat's crew did not always consist of the same men. It is also worthy of remark, that of the "*houses*" selected by the military authorities for the reception of the numerous cases of cholera sent in at this time from the army, *one* was at the principal landing-place, and but three or four steps from the boats. This house I saw crowded with sick soldiers, who, from the necessity of that era, were compelled to lie upon the earthen floor, with only their own soiled blankets under them.

Balaklava looked like the extinct crater of a volcano, holding in its bosom an ovoid-shaped lake, supplied with water from the sea through a large zig-zag rift in the rocky mountains which bounded the coast. Mountains enclosed it on either side, varying from 300 to 700 feet in height, and descending to the water almost perpendicularly, or in a very steep incline. On the eastern margin of the lake (its extremes pointing north and south) was a small slip of ground, almost on a level with the water, and sufficiently capacious to admit of a double and a treble line of very ordinary-looking low houses, through which ran the main road. On a rocky prominence, which formed the eastern point of the zig-zag rift, and which more immediately commanded the entrance, as well as the lake or harbour, were to be seen the picturesque ruins of a Genoese fortification; whilst a church, with an unfinished wooden dome, and a small range of buildings called the Hospital, but said to have been originally a training-school for children, formed the prominent and chief architectural objects in this small and poor town. The mountains, receding from the inland or northern aspect of the harbour, left a

marshy flat, and gave view of a smiling fertile valley and plains, extending far inland, and overlooked in their turn by more distant hills and mountains. The road from the town led along the ovoid margin of the basin through the swampy ground out into the valley, and wound among the hills towards Sebastopol.

The highest mountain that commanded Balaklava was on the eastern side, and, according to Captain Spratt's chart, stands 1227 feet above the level of the sea. This was taken possession of by the marines, after they had been encamped for some days on Mount Hiblak, which stood more immediately over Balaklava, at a height of 723 feet.

In the early part of the occupation, parties of marines were stationed in and around the town, and many of these men were attacked with cholera. One poor fellow, a marine of the "London," was attacked whilst on his post during the night of the 1st October, and there being no room for him in the hospital, he was found next morning by an officer of the "Agamemnon," and sent on board to our sick-bay; but treatment was of no avail, for he died the following day, the 3d October. This man was under treatment in our sick-bay when Perrington, the coxswain of the "Launch," was admitted.

Another man, a marine of the "Leander," seized with symptoms of cholera on the night of the 10th October, whilst on the magazine guard, was received on board the "Agamemnon" at 8.30 A.M. of the 11th, and died at 2.15 P.M. A captain of the Coldstream Guards, recovering from an attack of cholera (and who afterwards died gloriously at the head of his men at Inkermann), was also a patient for a few days at this time on board the "Agamemnon."

Of all the cases of diarrhœa which occurred amongst our men during this period, only one merged into cholera; a seaman, G. Palmer, aged 20, admitted on the 11th October, and after a mild attack, discharged to duty on the 17th October.

The duties of the "Agamemnon" were now shared by the crews of other ships; and on the 15th October she left Balaklava, to take her part in the bombardment of Sebastopol, on the 17th October 1854.

At noon of the 9th November 1854, whilst at anchor outside of Balaklava, we received from the Marine Brigade, encamped on the heights, a marine artilleryman, J. Munday, aged 48, labouring under cholera. This case (our 20th) terminated fatally on the following evening, the 10th November.

Although diarrhœa was still a frequent complaint amongst our men on board, it was not of a severe character; or rather, not so much of a choleraic as of a dysenteric character. But cholera and choleraic diarrhœa prevailed amongst our marines and blue-jackets in the brigades on shore; and, when practicable, all these, and other bad cases, were sent on board their respective ships for treatment. Our average number during the first three weeks in November was 33

(our marines being encamped on shore); but, on the 22d November, we received from camp twenty marines and three blue-jackets, all labouring under dysentery, diarrhœa, and fever. There were also several cases of scurvy, and a tendency to low fever amongst our men on board. The weather at this time was cold and wet, with occasional severe gales, and much stormy weather. Fresh provisions, and more especially vegetables, being very scarce.

I now come to what I consider a still stronger instance of the contagious or infectious nature of cholera; though I am free to confess, that the senior medical officer, who saw the cases, at the request of the Commander-in-Chief, Admiral Dundas, held a different opinion as to their origin.

I refer to the sudden appearance of cholera amongst our men on the 15th and 16th December 1854, immediately after coaling from H. M. S. "Industry." The disease certainly prevailed, and to a considerable extent, amongst the troops on shore, but the fleet had been free from it for a considerable time; and although our ship had a large sick-list (about 55), it consisted chiefly of scorbutic cases, and the cases of dysentery and debility received from camp. But the victims, in this instance, were not selected from amongst these debilitated and sickly men: our most robust and efficient men were the victims; and that, because the poison did not exist within the "Agamemnon," but was inhaled by our men whilst in the "Industry."

The "Industry" was an iron, flush-decked screw-steamer, laden with coals for the service of the men-of-war blockading Sebastopol. Whilst lying at moorings in Balaklava harbour, one of her seamen (a coloured man) broke his leave, and spent several days on shore drinking. (Numerous deaths from cholera occurring at Balaklava at this time.) She left Balaklava on the 8th December, with this man on board, ill from choleraic diarrhœa and excess. She joined the fleet off Sebastopol the same day, bringing with her a certain number of invalids from camp.

On the 11th December, Mr M——, her clerk in charge, was taken ill with choleraic diarrhœa, or cholera: on the 12th and 13th, three men of the ship's company were taken ill with similar symptoms,—the master and commander, Mr B——, being also attacked on the 13th. She had finished coaling the screw line-of-battle ship "Algiers," when she came alongside of the "Agamemnon," and at 8 A.M. of the same morning, the 13th December, our men went into her holds, and commenced filling the coal-bags. The work was continued by our men, in alternate watches, during that day and the succeeding night; and at 5 A.M. of the 14th, the *afterhold* of the "Industry" having been cleared out, the maintopmen (50) ceased working, and returned to the "Agamemnon" to wash and clean themselves. As our ship was not completed, the foretopmen continued the work from the *forehold*, in which they had been engaged since 8 A.M. of the 13th; and at 4 P.M. of the 14th December, our

ship was complete with coals, and the foretopmen also returned on board their own ship; whilst the "Industry" hauled off, and went into Kazatch bay.

Four hours after she hauled off, that is about 8 P.M., W. Ash-down, aged 27, ordinary seaman, one of the party of foretopmen, was attacked with diarrhœa, and at 9 P.M. with vomiting; of neither of which he complained until an hour after midnight, when he was found suffering from cramps and other symptoms of cholera. There were hopes at one time of this man's recovery; but the secretion of urine did not return, and he died of consecutive fever on the morning of the 20th December. W. Lambard, aged 43, leading seaman, of the same party, was seized with cholera at 10.30 A.M. of the 15th, having been attacked with diarrhœa at one o'clock that morning. He died at 5 A.M. of the 16th. J. Trodd, aged 41, chief captain of the forecastle, admitted with choleroïd diarrhœa on the morning of the 15th, having had diarrhœa since the evening of the 13th. He recovered, and returned to duty on the 18th.

On the 16th, five more cases of cholera, and two of choleroïd diarrhœa, were admitted from the same party; all of whom stated that purging came on subsequent to their having been at work in the "Industry," and from five to eight or nine hours before the cramps and other dangerous symptoms came on.

Of these, W. Harvey, aged 24, ordinary seaman, was attacked with diarrhœa during the afternoon of the 15th, had vomiting and cramps during the night, but was better next day; his symptoms assuming a febrile character. He was discharged to his duty on the 17th January.

G. Pitts, aged 21, ordinary seaman, had slight diarrhœa on the morning of the 15th, which increased during the day; at 8 P.M. he had severe cramps, but his symptoms afterwards improved, and he returned to his duty on the 3d January.

J. Foakes, aged 31, boatswain's mate, attacked at 4 P.M. of the 15th with severe diarrhœa. Came into the sick-bay at 7.30 P.M., having a peculiar pinched expression of countenance, and suffering from severe cramps of lower extremities. He went to the water-closet, where he fainted, and fell from the seat. Collapse followed, and he died at 11.30 A.M. of the 16th.

T. Fennell, aged 36, A. B., attacked with diarrhœa at 5 P.M. of the 15th. Admitted at 9 P.M. with severe cramps and other symptoms of cholera. At 2 A.M. of the 16th, he appeared relieved, and more composed; shortly after which, whilst others around him were suffering and writhing in agony, he turned over on his right side, and folded his arms as if with the intention of composing himself to sleep. In this position he was found defunct at 4.30 A.M.

H. Burke, aged 21, ordinary seaman, also of the same party, had been most zealous and efficient in relieving, by frictions and other means, the spasms, etc., of the other sufferers. Admitted at midnight of the 15th, whilst still at work in the sick bay, having been

purged about ten times that afternoon: was seized with vomiting when admitted. Severe cramps came on at 4.30 A.M. of the 16th. At 10 A.M. he was in the collapsed stage, and suffering greatly (more so than any of the others) from cramps. He sank, and died half an hour after midnight of the 16th.

W. Henderson, aged 28, stoker, admitted at 7.15 A.M. of the 16th with diarrhœa, which commenced two hours before. It was, however, soon checked, and he returned to his duty on the 19th. This man stated that he was quite well until he turned out of his hammock that morning, and then felt chilled on putting his feet on the wet deck. When admitted, his face was pale, and covered with cold perspiration. He had not been at work in the "Industry," but was engaged coaling in the "Agamemnon."

P. Cresswell, aged 37, leading seaman, was brought into the sick-bay at 2 P.M. of the 16th by his messmates, and much against his will, as he stated that he had only been purged twice since he had been on board the "Industry," and had not vomited. His messmates, however, told me, in his presence, that he had been suffering from cramps that forenoon, and that they had been rubbing him. After a little time, he acknowledged that he had been purged eight or nine times the previous evening.

There were no dangerous symptoms in his case, if we except one rice-water stool passed subsequent to his admission. He returned to duty on the 27th December.

Another man of the same party, who was admitted on the 15th December, had also a slight attack of diarrhœa; but, as he chiefly complained of scorbutic and pyrexial symptoms, I have not included him among the sufferers.

Thus it appears, that between the 14th and 17th December 1854, of a party of 51 men who had been at work in the *forehold* of the "Industry," seven of our best seamen, strong, stout, able-bodied men, were attacked with cholera, of whom five died, and two more, with choleraic diarrhœa, who recovered.

The whole of the men, amounting to 120, who were employed in the work of coaling, were mustered under the half-deck on the evening of the 15th. All were questioned and examined, and (with the exception of three who had slight diarrhœa) appeared to be quite well. The same measures with respect to the administration of quinine wine were adopted as on former occasions.

It may be asked, was it singular that cholera should appear on board the "Agamemnon" at this time more than at another? And why do I attribute it to the "Industry," seeing that the "Algiers," from which she had just come, was not affected in the same way? I answer, that the fleet had been so long free from cholera, and the general state of health of the crews, so free from choleraic diarrhœa, or even a tendency thereto, that the first announcement of our cases was received by the Commander-in-Chief with surprise and incredulity.

With respect to the "Algiers," I might suggest that the poison had not acquired sufficient *intensity* at that time; but a better answer is, that *our own maintopmen*, who worked for twenty-one hours on board the "Industry," were *not affected*, whilst the *foretopmen*, who continued working eleven hours longer, were the victims. And why? Because the forepeake, in which still lived the coloured seaman, first taken ill, and the other three seamen taken ill between the 12th and 13th December, partly projected into the forehold; and the longer our men worked, the deeper they descended, until they came upon a level with, if not under, the flooring of this forepeake, in which also lived and slept the ship's company of the "Industry." This place was filthy in the extreme; the dejections and ejections of the sick had been allowed to accumulate; the flooring was quite wet; and when Mr Chapman, assistant-surgeon, R. N., went on board, he was the first to order the buckets to be emptied, the flooring to be washed, and chloride of zinc solution to be sprinkled about. Mr Chapman called my attention to these matters, and more especially to the state of Mr M——'s cabin, in the after-part of the ship. At the time of my visit with Mr Chapman (noon of the 14th), I found Mr M——, the clerk in charge, in bed, suffering from frequent vomiting and purging. Having no servant or attendant of any kind, his cabin was, as Mr C—— described it, "filthy from the dejections, etc., on the floor." Mr B——, the master and commander, had been taken ill the previous day, and his countenance appeared to me most expressive of a choleraic attack. The purifications were still going on in the forepeake when I visited it; but the place was so dark, that it was difficult to discern clearly the countenances of the men in bed.

Before Mr Chapman went on board, all the skylights, hatchways, and openings in the deck, had been covered over with tarpaulins and sails, to prevent the coal-dust from penetrating to the cabins and mess-places, and also as a protection against the rain then falling.

After leaving us, the "Industry" was ordered to supply with coals H. M. S. "Miranda," in Kazatch harbour; but, in consequence of *our cases*, she had not been half an hour alongside that ship, when she was ordered to haul off, and to clear out alongside of H. M. S. "Megæra." Her officers and crew were transferred to the latter ship, and the "Industry" underwent a thorough purification. The only fatal case amongst her crew was that of the coloured man, J. Gamble, who died on board the "Megæra" on the 16th December.

The "Industry" had also been alongside of the gun-boats, "Snake," "Lynx," and "Beagle," previously to her having gone to the "Algiers." They were more likely to escape infection than the "Algiers," as they required but a small quantity of coals, and obtained it, of course, from the higher strata, subject to a better ventilation.

My visit to the "Industry" was at the request of the late R. P. Chapman, Esq., surgeon of the Naval Brigade, then an additional assistant-surgeon of H. M. S. "Vengeance," sent to attend the sick of the "Industry." As our cases of cholera had not then occurred, nor were they even anticipated, my attention was not particularly directed to tracing out any peculiarities in her forepeake; and I cannot, therefore, assert as a fact, what I think it not unreasonable to infer, viz., that either previous to, or during, the purifications (perhaps both) of the flooring and bulkheads of the forepeake, some portion of the contaminated fluids from the sick, or the effluvia from the sick, may have leaked through the joinings of the bulkheads, or through the joining of the bulkheads and flooring, into the *forehold*, where our men were at work, and where some of them went to sleep.

An interval of six months now occurs between the date of the foregoing cases and the appearance of the next (our 28th case). This interval of time was passed in watching the harbour of Sebastopol. Our marines and seamen, who had been serving in the brigades, returned to us in January and February 1855. The numbers on our sick-list, which had ranged between 50 and 60 during the months of December 1854, January and February 1855, had decreased to an average of 30 during the month of March; and in April, descended as low as 18, and from that to 8, to 7, and to 6. In May 1855, the numbers averaged about 8, and in the beginning of June, as few as 4; when they again rose to 18, and to 22, by the arrival of sick from the Marine Brigade at Yenikalé, the ship being at that time in the Straits of Kertch.

At 8.45 A.M. of the 16th May (the ship being then at anchor off Sebastopol), one of our carpenter's crew, named J. Whyte, aged 29, was brought on board from H.M. steam-vessel "Medina," labouring under cholera. He was one of a party of carpenters employed on shore, near our factory at Kazatch, repairing boats, building huts, etc. He had slept in a hut with the others, for four nights, before he went on board the "Medina," where he was ordered, on the morning of the 15th, to attend to some repairs. At 10 o'clock that night (having, according to his own statement, been quite well when he entered on board), he was seized whilst in bed with vomiting and purging, of which he did not complain, or of which no notice was taken, until about 8 o'clock next morning, the 16th, shortly before he was removed to the "Agamemnon." In spite of assiduous and unremitting attention, and having one or other of his messmates in close attendance on him, he gradually sank, and died at 6.15 P.M. that day. As the "Medina" was, I believe, free from cholera, and as he only went on board on the 15th, it appears most probable that he contracted the disease on shore, where cases were occasionally occurring.

An expedition to Kertch having been determined on, we embarked on board the "Agamemnon," on the 2d May, 500 French troops,

and some field pieces, and started next day in company with other ships of the expedition. On the 5th, as we were preparing to land our troops, we were recalled; and, returning to the anchorage off Kameish on the 6th, there landed our allies.

On the 23d of the same month, we embarked a similar number of Turkish troops, and on the following day, the 24th May, landed them with our marines at Kertch; which was taken possession of by Sir George Brown, at the head of an allied army of 10,000 men. The weather being hot and oppressive, with a scarcity of water, and the thermometer at 85°, the march of the army on the following day, from Kertch to Yenikalé, a distance of 10 or 12 miles, was most trying, and many of the men fell out by the way. This fatigue most probably proved the exciting cause of the cholera appearing amongst the troops; the seeds of the disease no doubt lurking amongst them, since their departure from the trenches in front of Sebastopol. At the same time, I must observe, that there was much thunder, lightning, and rain, on the 26th, 27th, and 29th May. Our seamen, however, who were much employed in the boats, and afterwards exposed for several days and nights in their boats, whilst engaged in the sea of Azoff, had no complaints.

On the 6th of June, we received on board, from the camp at Yenikalé, 13 marines, sick and convalescent. Six of these were cases of diarrhœa and ptyalism; having been treated for attacks of cholera. On the 7th June, all the marines, after having been a fortnight encamped with the army at Yenikalé, were re-embarked on board a small steamer, named the "Brenda," in which, notwithstanding their crowded and inconvenient state, they were, in consequence of bad weather, obliged to remain on deck until the 9th, when they succeeded in getting on board their own ships.

At 5.15 A.M. of the 10th June, W. Smith, aged 32, marine, was admitted in the collapsed stage of cholera. He stated that he had not suffered from diarrhœa whilst on shore, and that his first attack of diarrhœa occurred an hour and a half previously. He got over the attack of cholera, but died of the consecutive fever at 8.10 P.M. of the 14th June.

E. Penny, aged 39, corporal of marines, admitted on the morning of the 10th with diarrhœa, which had increased since 4 A.M. He had had diarrhœa for three or four days. There was some vomiting, but no severe symptoms, and he was discharged to duty 23d June.

W. Burgess, aged 32, corporal of marines, was admitted at 6 P.M. of the 13th June, suffering from vomiting and purging, with cramps of lower extremities. Had been suffering from diarrhœa during the two previous days, and had taken some chalk mixture. After the 15th, he gradually improved, and returned to his duty on the 25th June. This was our thirtieth case of cholera.

There is still one other case to mention, to conclude the series. It occurred on the 22d June, eight days after the last-mentioned case, and subsequent to our return to the blockade of Sebastopol.

The patient, a weak old man, named J. Connell, aged 54, A. B., was attacked at 1 A.M. with diarrhœa and vomiting, succeeded in three hours by cramps, coldness of surface, weak pulse, white tongue, etc. At 7 A.M. he was better, and before midnight secretion of urine returned. He was discharged to his duty twelve days afterwards. At any other time this might have been considered a case of English cholera.

To sum up the cases of the "Agamemnon," it is necessary to state that, between the 1st August 1854, and the 8th September 1855, there were treated of the ship's company, 277 cases of diarrhœa, of which died 1, being a marine, who died two hours after his arrival from camp, in a state of exhaustion; 31 cases of cholera, of which died 24, recovered, 7.

Of these 31 cases of cholera, there are 22 cases clearly traceable to causes exterior to the "Agamemnon;" the patients being men who were taken ill, either on board the transports, in which they were at work, or shortly afterwards, viz.:—

1. Six cases, between the 26th August and 8th September 1854, whilst embarking troops, horses, cattle, etc., at Varna.

2. Five cases, on 17th and 18th September 1854, whilst disembarking the same at Old Fort.

3. One case, from camp at Balaklava, 9th November 1854.

4. Seven cases, caused by the "Industry," between 14th and 17th December 1854.

5. One case, from the "Medina," 16th May 1855. Most probably contracted his disease on shore.

6. Two cases from camp at Yenikalé, Straits of Kertch.

The remaining 9 cases may be accounted for as follows:—

1. The man Golding, gun-room steward (included among the seamen), 4th August 1854, most probably contracted the disease at Baljik or Varna.

2. The marine, Pood, attacked 8th August 1854, four days after Golding.

3. The boy Hoskins, admitted with diarrhœa, 12th August, attacked with cholera 23d August (included among the seamen).

4. The marine, Mumford, attacked 29th August, same time as Mustin, and, according to official letter (see note), was of the same working party.

5. The marine, Gillman, admitted with diarrhœa, 24th September, attacked with cholera 27th and 28th September. This man was most probably on shore assisting the wounded and sick soldiers after the Alma. His attack of cholera occurred after our arrival at Balaklava.

6. The marine, Buckland, attacked with cholera, 27th September, at Balaklava.

7. The seaman, Perrington, attacked with cholera, 3d October, at Balaklava, was coxswain of boat conveying troops and stores from transports to the shore.

8. The seaman, Palmer, attacked with cholera 11th October.

This seaman was employed both in the boats and on shore at Balaklava. We had a case of cholera on board at the time.

9. The seaman, Connell, attacked 22d June 1855; a slight case, occurred eight days after the cases from camp at Yenikalé.

The whole numbers of cases of cholera may be again divided as follows:—

Marines attacked with cholera, 16, of whom died 14; recovered, Gillman and Burgess.

Seamen attacked with cholera, 15, of whom died 10; recovered 5.

Marines affected by working in transports, 9.

Marines received with cholera from camp, 3.

Seamen affected by working in transport "Industry," 9.

Seaman received with cholera from "Medina," 1.

In the foregoing pages I have endeavoured to state the facts respecting the cholera, as they came under my own observation, in as clear and unbiassed a manner as possible. Previous to this visitation of 1854, I was of opinion that contagion had little or nothing to do with its propagation; but my opinion gradually altered as I witnessed cases of cholera brought on board from transports, etc., and occurring also amongst men more especially employed in transports where cholera existed, or in which were embarked troops from the very *foci* of the disease.

I consider that many of the cases herein referred to, afford strong grounds for arguing in favour of the infectious or contagious nature of cholera; and I therefore stated, at the commencement of these notes, my opinion, that the disease was imported into Bulgaria by the French troops.

Before I had come to this conclusion, I had heard this opinion enunciated by French as well as Italian and Turkish medical men, conversant with the disease at Varna, and elsewhere; and, in support of it, I would now quote certain passages referring to the prevalence of the disease in France, prior to the embarkation of troops for the seat of war in the East. I would premise these quotations, however, with the following fact.

On the 26th May 1854, 300 French troops were landed at Varna from the French steamer "Cacique;" and on the same day the English steamer "Cyclops" landed, at the same place, 70 English sappers and miners, with a few horses. These were among the first, if not the very first, troops of the French and English armies that landed at Varna.

Medical Times and Gazette, July 1854, p. 19.—"The cholera at Paris.—This disease has rather increased during the preceding fortnight. The last bulletin indicates a sensible augmentation in the number of admissions; that of the week, 12th to 19th April, announces 75 new cases—a number double that of the *two preceding weeks*, in one of which there were 31 cases, and in the other 32. . . . The epidemic, though still confined to certain districts, shows a tendency to spread," etc., etc.—*Gaz. de Hôpitaux*, April 22.

Page 23, same volume.—“Health of the British Troops in Turkey.—By a letter with which we have been favoured from Constantinople, dated June 15, we find that the whole force of infantry at Varna, Scutari, and Galipoli, is 21,863. Of these, 821, or $3\frac{1}{2}$ per cent., are on the sick-list. The force of artillery is 2108, $2\frac{1}{2}$ per cent. only being sick. Of the small force of cavalry arrived up to that date, 8 per cent. were sick, but mostly from slight accidents. The infantry force is distributed as follows:—At Galipoli, 5187, of whom 175 are sick; at Varna, 6005, 219 being sick. The remainder of the force is at Scutari.”

Page 49, same vol.—“The Cholera in France.—The cholera is making serious ravages in several parts of France, and especially in the department of the Aulse and the Upper Marne. There are no less than 15 departments affected with the disease.—‘Dated June 1854.’”

Same page.—“Sickness in the Black Sea Squadron.—The sick in the French fleet, according to our last letter, did not average more than $3\frac{1}{4}$ per cent. Our own was a fraction under 5. Scurvy had begun to show itself in both fleets,” etc.

Here I would mention that on the 30th June 1854, 12,000 French troops arrived, and were landed at Varna. They came in five line-of-battle ships, commanded by Vice-Admiral Bruat, with a Rear-Admiral under him. I cannot state from what port they came, but my impression is that they came direct from Galipoli or Marseilles.

Page 75, same vol.—“On the 27th June, the British force at Varna was 30,000 strong; and an advanced light division, about twenty miles from Varna, was nearly 7000 strong, independent of cavalry. The sick of the main body, and of the advanced division, did not amount to 3 per cent. of the strength. One case of spasmodic cholera had occurred, but there had been none since the 20th. Diarrhoea had prevailed to a considerable extent, but had ceased after the site of the encampment had been altered, and warm tea and coffee had been issued as morning meals for the soldiers.”

Same page.—“Black Sea Fleet, 29th June.—The fleet is uncommonly *healthy*, the average number of sick being not over $2\frac{1}{2}$ per cent.”

The cholera was not known among the Turkish troops at Shumla and Silistria, as may be inferred from the following statement, quoted from the same page:—“State of the wounded at Shumla and Silistria.—By a private letter received from a friend, dated at Shumla, June 19, we learn that two British surgeons have been through the sick and wounded of the Turkish army at Shumla and Silistria. They report that their hospital system is very good indeed, and at Constantinople and Varna, and wherever they can carry it out, excellent; but at Shumla, and at Silistria, where hundreds are crowded into a barrack not formed for the reception of wounded, it is lamentably sad. In one barrack, there were 1370 cases, and no less than 150 men in bullock-carts outside, who had been more than

five days in them. Many had died there. Scurvy was general. . . . There was no intermittent, but much typhus."

Page 100, same vol.—"Malta.—The quarantine is again in force in this island, and several rooms in the Lazaretto are occupied. On the 4th inst. (July), the French mail steamer "Egyptus," from Marseilles, arrived in port, when it became known that two of the soldiers on board had died on the previous day, and 12 of the others had been attacked by violent colic and dysentery. The vessel was immediately placed in quarantine. It seems that the "Egyptus," a small steamer, was crowded with troops and horses, besides supplies of forage, in addition to the usual number of passengers. These were all landed in the Lazaretto on the 5th. The number of sick left behind was 22, of whom two died on the evening of Thursday, one on Friday morning, and one on Saturday; *and one of the men engaged in coaling the vessel has been attacked and died.* Although there can be little doubt that cholera is the disease that now exists in our Lazaretto, yet at present it is not of a very malignant character. The men attacked were troops who, having been marched from Avignon to Marseilles, were kept on the quay at the latter place, four hours previous to embarking, under a broiling sun; they indulged in the enjoyment of fruit and wine, without moderation, and afterwards embarked in a vessel greatly overcrowded."

Page 125, same vol.—"Cholera in the South of France.—On the 15th July, the deaths at Avignon had reached 300. At Montpellier, there had been 41 cases, and 16 deaths, in hospital. It was raging severely at Marseilles."

Page 245, vol. 2d, Sep. 1854.—"Extension of the Cholera in the South of France—. . . . The cholera, which, unless proceeding directly from the Levant, as at the period when it broke out in Alexandria, Smyrna, and Constantinople, in 1847 and 1848, has remained confined in the basin formed by the shores of Spain, Provence, Italy, and Algeria, this time has manifested itself almost as rapidly at the Piræus, and in Galipoli, as at Genoa, Leghorn, and Naples. This rapid and altogether exceptional course of propagation may be explained, in part, by the unusual assemblage of human beings at Galipoli and the Piræus, and in part by the incessant communications which have taken place between sections of the army and the infected localities in France. In consequence of the war, an almost continual communication has been kept up between Toulon, or Marseilles, and the different stations of the French oriental army. Now the sanitary condition of the troops which embarked at the South of France for the East, presented, at the outset of the expedition, peculiar characters. At that period, when the cholera had not as yet made its appearance in the south, the regiments despatched from Paris and its environs most probably brought with them the germs of the disease, which immediately afterwards appeared. Since then, the principal towns in the south of France, having been attacked by cholera, so as to constitute true centres of

the epidemic, it will be readily acknowledged, that the greater number of the corps which embarked in Marseilles, were unequivocally influenced by the prevailing malady. On this point, however, positive testimony has been furnished. A regiment which arrived from Montpellier, and remained during the month of June twenty days at Marseilles, sent to the hospital, on the very day of its embarkation, 16 men suffering from choleraic diarrhœa. In the 7th regiment of dragoons, which remained sixteen days at Marseilles, the inspecting medical officers discovered more than 60 cases of diarrhœa, at the moment of its departure for the East. The outbreak of the cholera at Galipoli coincided with the arrival of these regiments, and of detachments similarly infected.

At the Piræus, the steamer "Alexander," which arrived on the 2d July, having left Marseilles on the 27th of June, discharged into the hospital three cases of diarrhœa, one of typhoid fever, and landed the body of a man who had died of cholera in the roadstead. The three men suffering from diarrhœa were fairly cured, and on the 7th of July they departed for Turkey. On the 9th, in the vicinity of the chamber occupied by these patients, some cases of cholera occurred. On the 11th and 12th, the number of cases rapidly increased, nearly all of whom were suffering from diarrhœa. Nearly all the enfeebled patients under treatment at the hospital were attacked, and 160 deaths took place between the 12th and 27th July. The disease carried off, besides two officers of the administrative hospital department, one clerk, four infirmary wardsmen, and it attacked with considerable severity one of the military surgeons. The 97th English regiment of the line remained with impunity ten days in the infected locality. At the same time, some cases declared themselves among the civil population."—*Gazette Médicale de Paris*.

As an additional proof that infected ships arrived at Varna, from France, I may mention here (although I cannot give the name of the steamer, nor the date of her arrival), that I was told at Varna by some English commissariat officers, who had just arrived in a French steamer from Marseilles, that several of the French soldiers on board had died from cholera during the passage.

Whilst cholera was still raging amongst the troops at Varna, the French expedition to the Dobrudscha was undertaken, partly with the view of diverting the attention of the men from the melancholy losses they were sustaining. On the 23d and 24th July, two thousand Zouaves embarked at Varna, whilst a much larger body of troops advanced towards Kustendjé by land. That this expedition proved most disastrous may be learned from the following quotation from *Russell's History of the War*, page 138:—"11th August 1854.—Mr Horace Vernet, who was up with General Canrobert's division in the Dobrudscha, draws a picture of the dreadful sufferings of the men there, which would exceed the greatest efforts of his pencil to realise. On his authority, it would appear that their losses were far greater than the French at Varna stated them to be. He

declares that, out of 1200 Zouaves who started for Kustendjé, only 480 returned; and that, out of 10,000 troops of the line, 4000 were left in the marshes of this death-swamp."

One of our naval officers, who at that time belonged to our fleet anchored off Baljik, informed me, not long afterwards, that during a visit he paid one day to the shore, he witnessed the return of some of the broken-down and dispirited remnants of that expedition. He entered into conversation with a soldier, whose weakness prevented his keeping pace with his comrades, and learned from him the sad story of their sufferings and losses. So numerous, and so rapid had been the deaths among them, that it was with difficulty they succeeded in gathering together, and heaping up within the huts, the bodies of the dead, which were then set on fire as the only mode of sepulture that could be adopted.

I am also indebted to the kindness of a friend, who was at that time serving on board the flag-ship "Britannia," for the following important facts connected with their return:—On the 8th of August this gentleman visited the encampment of these troops near Baljik. He conversed with both officers and men, and heard from them that they had lost 2000 men from cholera, and that the first division had sustained a much heavier loss. The disease had broken out amongst them during their rapid and forced marches under a broiling sun, aggravated and intensified by the privations consequent on a thinly inhabited country, and more especially by the scarcity of water; for which necessary of life they were obliged to have recourse to stagnant pools, muddy streams, and even wells, and other collections of water, in which dead bodies were lying. So harrowed were their feelings, and so deeply impressed were their minds, with the horrors through which they had passed, that they could not help exclaiming, "that a few days more, and the whole expedition would have been completely disorganized."

I am anxious to draw attention to the sickly and dispirited condition of these troops at the time of their arrival at Baljik, because I fully believe that to them is due the subsequent virulent outbreak in the French and English fleets. No other troops had encamped in that neighbourhood, and the date of their arrival must have been previous to the 6th of August, as, in the Nosological Return of the "Trafalgar" (see *Sir William Burnett's Report*, page 10), it is stated—"On the 6th of August we were congratulating ourselves on the healthy state of the crew, there being only twenty-three men on the sick-list, *while the land forces on shore, at Baljik, were suffering most severely.*"

Their encampment was on the plateau overlooking the sea, and extended from the neighbourhood of the stream (which supplied the mill and principal watering-place) to the height immediately over and north-west of the town. The soldiers crowded into Baljik in search of provisions and other necessities, and there mingled freely with the sailors of the fleets and the few inhabitants remaining in

the place. The fountains also, which were daily crowded with the seamen of both fleets, were also frequented by these troops; but more especially were they seen in crowds washing themselves and their clothes on the face of the acclivity, over which poured the stream which supplied the fountain and mill, marked in the chart as the principal watering-place at Baljik.

This contaminated stream and fountain formed the chief, and, at one time, the only, resort of the "watering parties" of both fleets.

There were two other watering-places. *One* being a small collection of water in the town near the beach, and fed by streamlets from the hills on each side of the valley in which the town was built; the other, supplied by a stream from the plateau, was distant about a quarter of a mile to the south-west of the principal watering-place, and about three-quarters of a mile from the town. This was taken possession of by the crew of the French war-steamer the "Primoguet," from Toulon, when they landed on the 14th July, and encamped there in consequence of cholera breaking out amongst them. The crews of all other ships were forbidden to water here; but it seems to me quite possible that the crew of the English ship-of-war "Diamond," anchored off this watering-place, may have taken water from it after the "Primoguet's" men had landed, and before they had wholly interdicted its use to others.

Or possibly, the solitary case which appeared in the "Diamond" on the 16th July, and believed to be the first that occurred in the English fleet, was due to the cholera-virus, or effluvia, having become detached from the sick of the "Primoguet," and blown by the wind to the "Diamond;" as it is stated in Sir W. B.'s Report, that "the weather at that time was tempestuous, and the wind blew towards the 'Diamond' from the position of this steamer and her tents." Is there anything unreasonable in the surmise, that the poison of cholera may become so intensified, that the winds may carry it a certain distance without impairing its deadly power; and that the cholera virus, or effluvia, arising from so many victims of the Kustendjé expedition, and adhering to the clothes and persons of the survivors, may have become detached and blown off to the ships? What may be called fiery land-breezes were not uncommon at Baljik; and I remember one which compelled the ships-of-war to drop an additional anchor to prevent their being blown out to sea.¹

That this mode of diffusion of the cholera poison had already oc-

¹ Except to those who have visited and walked through encampments of such vast assemblages of men as were collected together at Varna, Baljik, and in the Crimea, it would be difficult perhaps to realise the startling "disregard," throughout such encampments, of the usual conventionalities of civilized life. The results, however, might well afford ample scope for the operations of the Sanitary Commissioners and their scavengers. The most active and most efficient scavengers, the "winds," no doubt dispersed, in a divided and diluted state, the poisonous emanations, though at the risk of infecting, more or less severely, according to distance and idiosyncrasy, those living beings breathing the atmosphere through which they passed.

curred to the minds of some of the surgeons of the fleet, may be gathered from a passage in the Nosological Return of the "Trafalgar," already referred to in Sir W. B.'s Report, page 10, where it is stated—"The weather was close and sultry, and the wind blew from the southward, partly off the land, until the 8th August. On that evening it shifted, and *blew a very hot blast from the shore over the encampment lately occupied by the French.* On the morning of the 9th two cases occurred; *the man first attacked had been on shore during the preceding day,* and had eaten freely of plums. Two other cases occurred the same evening; and, during the night, there were about six."

It is also deserving of remark, with reference to this "surmise," that the flag-ships of the two fleets, viz., the "Britannia," the "Ville de Paris," and the "Montebello," anchored close to each other, were the greatest sufferers. The "Britannia" lost 139 men, the "Ville de Paris" 140, and the "Montebello" 230.

Be this as it may, there is sufficient evidence to show that the communication between the sickly soldiers of the Kustendjé expedition, and the sailors of both fleets, was free and unlimited; that the same watering-places were frequented by both; and that the first case of cholera in the English fleet, resulting from this "entente cordiale," took place in H.M.S. "London" on the 7th August.—(Sir W. B.'s Report, p. 5.) To quote from the same authority, the next case was in H.M.S. "Vengeance," on the 8th August. And, on the 9th August, the following ships had their first cases, viz., "Britannia," "Albion," "Furious," "Trafalgar," and "Tribune." On the 10th, the "Rodney's" first case made its appearance; and, on the 12th, the "Vesuvius" had her first case. This steamer had arrived at Baljik on the 5th August, and her boats' crews communicated with the shore; up to that time they had been healthy. On the 11th, six days after her arrival, diarrhœa broke out on board; and, on the following day, when she sailed for the Sulina, the first case of decided cholera occurred.

The "Furious," after a cruise round the coast of Circassia and the Crimea, returned to Baljik on the 4th of August, and anchored much nearer to the principal watering-place than most of the other ships. At that time the health of the ship's company was good. "Yet, though the weather was intensely hot, it does not appear that their health suffered in the slightest degree." The ship's company were subsequently employed in clearing out the hold, *watering*, and in other duties of a laborious nature. At 4 A.M. of the 9th August the first case of cholera occurred, and, in the evening, the disease began to spread with fearful violence.

One more quotation from the same report, and I have done. Page 6.—"Mr Rees, surgeon of the 'Britannia,' in one of his reports, states that, up to the time when the cholera made its appearance on board, the crew had been in the enjoyment of most excellent health; and, on the 30th of July, when they anchored at Baljik,

they were in a most favourable condition to encounter the epidemic, which was then raging in the French fleet lying in their immediate vicinity. The ship anchored about a mile from the shore under the chalky cliffs on the coast of Roumelia," etc.

I have quoted this passage from Mr Rees's valuable report, partly to show the healthy state of the ship's company previous to the outbreak, and also to notice the statement respecting the prevalence of the epidemic in the French fleet at the date of his report, the 30th July.

I am not aware when this epidemic commenced in the French fleet. Probably the statement refers to the epidemic on board the French line-of-battle ship the "Valmy," attacked at Varna on the 28th July, and obliged to put to sea; or possibly the "Montebello,"¹ and the other four line-of-battle ships, which brought to Varna and landed 12,000 French troops on the 30th of June, may have been rendered sickly by the troops they carried after they joined the fleet at Baljik. Would not this account for the greater mortality in the "Montebello?"

But, at all events, there is no doubt that, on board several ships of the French fleet, a sudden outburst of the disease occurred on the 10th August. This I have from the before-mentioned officer of the "Britannia;" and, if I may take the liberty of quoting from a pamphlet, printed for private circulation by Major-General W. Brereton, C.B., K.H., it is also stated in the first paragraph of his pamphlet, in these words—"The allied armies at Varna had suffered severe loss from cholera, as had the French fleet also; of the latter, in one day, the 10th August 1854, 62 seamen had died on board the 'Ville de Paris' and the 'Montebello.'"

To this I would add the following facts, which I was allowed to copy from a letter written during the height of the outburst, and dated from H.M.S. "Britannia," on the 15th of August, by Mr Simpson, secretary to the Commander-in-Chief:—"The French squadron has lost 500 men; the 'Ville de Paris' 109, the 'Valmy' 89, the 'Montebello' 152."

Although cholera, in an epidemic form, had ceased to exist before the allied fleets and armies sailed for the Crimea, cases occurred here and there, showing that the disease had not wholly disappeared. Burials at sea were of daily occurrence, and as I have, at page 21, in the body of these notes, mentioned the name of one transport in which cholera prevailed during the passage, it is improbable that, out of some 50,000 troops and 20,000 seamen that composed the expedition, this transport should have been the only one victimised. (There were landed at Old Fort 57,000 soldiers, 11,000 horses, and 170 guns.—Sir Richard Airey's evidence.)

That the disease was only "smouldering," if I may use the expression, and ready to break out when the exciting causes became

¹ Flag-ship of Admiral Bruat.

sufficiently powerful, is, I think, abundantly evidenced by the various cases which occurred amongst our ships during and after the landing at Old Fort; and by the numerous cases amongst the troops subsequent to their advance, and immediately after the battle of the Alma.

Here, as in the previously detailed instances of the Kustendjé expedition, and the march from Kertch to Yenikalé, I believe that a powerfully exciting cause was the great scarcity of water, impelling both officers and men to the necessity of imbibing muddy, and often loathsome, water, across which a whole army had trampled. And I have heard officers say that, on the morning after they disembarked at Old Fort, they were glad to avail themselves of the pools of rain-water in which they had been lying without any protection during the whole night. During the four days that our army remained in the neighbourhood of Old Fort, casks of fresh water were daily sent to them from the ships of the fleet.

After the battle of the Alma, it was rumoured that the cholera had been amongst the Russian troops stationed at the Alma, and that the outbreak amongst our troops was due to their occupying, for two nights after the battle, the ground from which the Russians had been driven. This I believe to be a conjecture, hazarded to account for the great mortality amongst our troops. I have not met with any authentic information on this point; and I think it improbable, as it was not alluded to in the Russian accounts of the battle, as it might have been, as a cause assisting in their defeat.

With regard to the further progress of the disease amongst our troops, I am unable to say more than that it accompanied the army in the celebrated flank march round Sebastopol to Balaklava, carrying off several victims during the march, and committing serious ravages amongst our troops in Balaklava and the neighbouring encampments.

The expedition of the allies left the coast of Bulgaria on the 7th September 1854; arrived off Eupatoria, in the Crimea, on the 12th and 13th September; commenced disembarking on the 14th, and on the morning of the 19th September, the whole army commenced the advance; on the afternoon of the 19th September a skirmish took place between the Russian cavalry and our advanced cavalry; and on the following day, the 20th, the Russian army was driven from its entrenchments behind the Alma.

During the whole of the two following days and nights, our seamen and marines, officers and men, were busily engaged in carrying the wounded and sick soldiers from the field of battle to the beach, a distance of four miles. The majority of the sick soldiers were labouring under cholera; many of whom died on the beach before they could be embarked, and a still greater number died immediately after embarkation, and during the passage to the Bosphorus. Some of the seamen and marines, who had been engaged in carrying the sick and wounded, were shortly afterwards attacked with cholera.

These may be said to be the last cases of an epidemic character which appeared in the fleet; and, as they were comparatively few, and I have already alluded to the case which occurred at this time on board the "Agamemnon," I will now conclude these Notes with a few words on the treatment.

A few words must indeed suffice, as we unfortunately found, to our sad disappointment, that, in almost all the first cases of each separate outbreak, the disease was quite intractable, and proceeded to its fatal termination, more or less rapidly, according to the intensity of the exciting cause, and irrespective of all remedial measures.

As, however, among several remedies exhibited, one or other may, in the estimation of the anxious observer, appear to claim a preference, I am inclined to attribute more beneficial effects to the administration of *calomel* than to any other medicine. I believe that the rapid exhibition of calomel, in scruple, ten grain, five grain, or two grain doses, either alone, or combined with opiates, will occasionally arrest the downward progress of the disease; but its immediate use must be had recourse to, if we would hope to have any power over the complaint. Conjointly with its exhibition must be the assiduous and persevering use of frictions of the whole body, but more especially of the parts attacked by spasm; and these frictions are best performed by the hands of three or four men, messmates of the patient, who are to be relieved by others in the same manner and time (two or four hours) as if taking their regular "watch on deck."

I have seen much and grateful relief afforded to the patient by constant frictions from the hands of muscular men. They ought to be continued, not only to the relief of spasm, but until some degree of heat (if possible) be restored to the surface.

To allay the irritability of stomach, and thereby assist the action of medicine, sinapisms are to be applied to the epigastrium, and draughts of chloroform, æther, opium, hydrocyanic acid, etc., are to be administered.

To allay thirst, and yet to avoid the vomiting sure to follow large draughts of water, or other drinks, it is necessary to administer frequently small quantities (from a tablespoonful to a wine-glassful) of water tinctured with brandy; and the time of its administration may be made subservient to, or coincident with, the exhibition of the calomel.

As local stimulants, sinapisms to the lower extremities, and turpentine epithems to the abdomen, were found to be of some benefit in our cases; and we also had recourse, in some cases, to an enema (though not in the exact doses), as suggested and practised by Dr Jamieson, then attached as staff-surgeon to the British Military Hospital at Varna, of half-a-drachm to a drachm of quinine, in brandy ʒi. and starch ʒij. ; or the same quantity of quinine in brandy, and beef-tea in place of arrow-root. We tried this enema, and re-

peated it, in the first case of cholera that came under our treatment at Varna, and this case recovered; but our subsequent trials of it did not confirm the favourable opinion we had formed of it.

In some cases, we combined the quinine (gr. iij.) with calomel (ʒj.), and administered this every hour; in other cases, the same dose of calomel was combined with a grain of opium; in others, calomel (gr. ij.) with opium (gr. $\frac{1}{4}$) every fifteen minutes; but, more frequently, calomel (gr. ij.) every ten minutes; the powder placed on the tongue, and washed down with a little water, tinctured with brandy, or with a draught of chloric æther, spt. ammoniæ aromat., or tincture of opium.

Camphor, combined with sesquicarbonate of ammonia, in the proportion of gr. iij. of the former to gr. j. of the latter, and made into a pill with the assistance of spt. rectificat. and confectio aromatica, was also administered in one case, but without any encouraging results.

The castor-oil treatment was also tried in four or five cases, but the results did not justify our pursuing it further. None of the cases in which we tried it recovered, but the same result would most probably have attended any other mode of treatment.

It is unnecessary to enter here into such minutiae as clean beds, warm bedding, tins and bottles of hot water to the feet and lower extremities, epigastrium, etc.

These remarks are applicable to the worst cases of confirmed cholera, which were generally the first to come under treatment. Of course, there were others of a milder form, in which our efforts were more successful; and there were many cases of diarrhœa with a tendency to cholera, which, but for timely treatment, would have doubtless merged into that disease.

It was, however, in the detection and management of the cases of premonitory and epidemic diarrhœa, that our efforts were of most avail, and afforded us the greatest satisfaction. Not only must our anxious attention be directed to these cases when they occur, but we must also watch the health of the men sent away on boat-duty, or on other detached services. And here our anxiety will be much relieved, and our labours greatly abbreviated, if we are assisted and supported by an energetic and discerning commanding officer.

In this respect, as in many others, the "Agamemnon" was fortunate.

All excesses committed by the men were severely punished.

When men were ordered on the duty of "watering," or procuring water from the shore, their names were sent to the surgeon; and on the following morning, immediately after they had taken breakfast, they were mustered by the officer in charge of the party, and, in his presence, each man took an ounce of quinine wine, and then entered his boat, taking with him a change of clothing. On his return, each man was again mustered in *dry clothing*, and, if it were deemed necessary, received another dose of the quinine wine.

The captain was particularly anxious and careful respecting the diet and clothing of the men, forbidding whatever was considered likely to induce diarrhœa, or render them more susceptible of the prevailing epidemic; whilst, at the same time, particular attention was paid to the comfort of the men in their messes, and especially to the cleanliness and ventilation of the different decks.

When an epidemic cholera visitation appeared imminent, such precautions were taken, that, although the "embarkation duties" in which our men were engaged still continued uninterruptedly, we were prepared to convert the principal deck of the ship into a hospital; and then, if need be, to sacrifice every other duty to that of attending on and ministering to the sick.

"Watering parties" were now discontinued, the use of shore-water forbidden, and recourse had solely to the use of water distilled on board.

When it became evident that the men employed on "embarkation duties" were those who chiefly suffered from diarrhœa and cholera, the same system was adopted with regard to them as had been practised with the "watering parties." Their names were sent to the surgeon on the previous evening; and each man received an ounce of the quinine wine previous to his leaving the ship; and in particular instances, in which the cholera had attacked some of the men, the quinine wine was administered, both morning and evening, to the whole of the men of the working parties, however numerous.

As a prophylactic, this remedy became very popular with both officers and men; and it was almost invariably sought for by both, when ordered on detached or night duty.

We commenced the use of *distilled water* some days before the expedition sailed for the Crimea; and to this kind of water, and the mode of obtaining it, without fatigue to our men, or their exposure to the "influences" and "attractions" of the shore, I attribute a good deal of our immunity from cholera.

I believe, also, that much of the immunity of the ships of the fleet engaged during the following twelve months in the blockade of Sebastopol, is due to the same cause; as almost, if not all, the ships which could not distil water, were supplied during that period by the "screw line-of-battle ships" with distilled water in sufficient quantities to meet all their wants.

Through the influence of the then Commander-in-Chief, Sir Edmund Lyons, repeated supplies of oranges were sent up to the fleet during the winter from Malta and Constantinople; and, by this arrangement, each man in the fleet (scurvy being at that time rather prevalent) received two or three oranges at each supply, and enjoyed this advantage for several weeks.

Fresh beef, and vegetables, chiefly onions, were also obtained, though not very regularly at first.

Through the same official influence, the medical officers of the fleet were enabled to procure various articles of diet required by the

sick; the commanding officers of the different war-steamers being empowered and encouraged, by the Admiral, to bring with them, on their passages from Malta and Constantinople, as many sheep, poultry, eggs, and bags of vegetables, etc., as they might deem compatible with the management of their ships.

With regard to the management of the "sick-bay," I may state that, whilst avoiding any unnecessary display of anxiety, or the appearance of a particular seclusion, such arrangements were made, that the sick-bay in which we received our cholera cases was kept as clear of visitors as possible; and although messmates were not forbidden, their visits were not encouraged.

Cases of sickness, not cholera, that required confinement to bed, were removed to a screened berth under the "half-deck;" and those patients who were able to move about, or who were admitted with trifling complaints, were allowed to remain below with their messmates, excepting during the "hours of visit," when their names were called over, their complaints inquired into, and their medicines administered to them.

The "cots" and "hammocks" of the cholera cases were hung as far apart as practicable. The ceiling, and various other parts of the "sick-bay," were frequently whitewashed. The flooring, after it was cleaned every morning, was frequently sprinkled with the solution of the chloride of zinc; and the "cots" and "hammocks" in the "bay" were also occasionally sprinkled with the same. A plentiful supply of this fluid was thrown into the water-closet, the night-chair, and the bed-pans.

A clean bed, if procurable, was always used for a fresh case, or the patient's own bed, if available.

When a patient died, his funeral took place at as early a period as possible; the body, in the meantime, being covered with the "Union Jack," was placed on the "booms" on the upper deck, or else close to an open port on the main deck, with a flag or screen hung round it.

All the bedding, and the clothes brought by the deceased into the bay, were immediately thrown overboard.

Sheets, towels, and other articles, belonging to the "sick-bay," were soaked, when thought necessary, in a solution of the chloride of zinc.

